AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1.   (Currently amended)   A printing workflow system disposed in a network for coordinating production of a document processing job among a plurality of autonomous cells, the printing workflow system comprising:

a search module for searching which one or more of the autonomous cells can execute the job and creating a ~~first~~ subset of <u>one or more</u> autonomous cells available to process the document processing job, wherein each autonomous cell consists of a logical grouping of resources, representing physical devices, sufficient for completing at least one type of document processing job;

a transfer module for transferring information to the ~~first~~ subset of autonomous cells about the document processing job;

<u>a bidding module including,</u>

<u>a process routings module for determining process routings needed to complete the document processing job,</u>

<u>a required processing time module for determining required processing time for completing the job for each of said routings, using optimal batch sizes,</u>

<u>a comparing module for comparing priority of the job with other jobs in a cell queue of at least one autonomous cell,</u>

<u>an estimation module for determining estimated release time for production of the job,</u>

<u>a cost function module for defining a cost function monotonically decreasing with a slack time when it is determined the job can be fully completed in the current autonomous cell by its due date,</u>

<u>a bid generating module for generating a bid based on the defined cost function,</u>

<u>an informing module for informing a system server of a</u>
<u>maximum job fraction achievable for the autonomous cell when it is determined the</u>
<u>job cannot be fully completed in the current autonomous cell, by its due date, and</u>
<u>a providing module for providing the system server with a cost</u>
<u>function that monotonically increases with the job fraction which can be completed;</u>
a receiving module for receiving bids <u>from the bidding module</u> in response to the information transferred to the first subset of autonomous cells to process the document processing job;

a selector module for selecting one or more autonomous cells to process the document processing job based on information in the bids received; and

a queuing module for dispatching the document processing job to the selected one or more autonomous cells for processing.

2.   (Currently amended)   The printing workflow system as recited in claim 1 wherein the printing workflow system stores all information regarding currently pending document processing jobs in each of said autonomous cell.

3.   (Previously presented)   The printing workflow system as recited in claim 1 wherein the printing workflow system stores all information regarding current document processing jobs that have arrived in a print shop and have yet to be allocated for production.

4.   (Canceled)

5.   (Currently amended)   The printing workflow system as recited in claim 1 wherein the selector module selects <u>one or more of the autonomous cells of</u> the first subset of autonomous cells with the lowest bids.

6.   (Currently amended)   In a printing workflow system a method for processing document processing jobs by receiving bids <u>generated</u> by a plurality of autonomous cells

to process the document processing job, the method comprising:

searching which one or more of the autonomous cells can execute the job and creating a first subset of autonomous cells available to process the document processing job;

transferring information to the first subset of autonomous cells about the document processing job;

determining process routings needed to complete the job;

determining required processing time for completing the job for each of said routings, using optimal batch sizes;

comparing priority of the job with other jobs in a cell queue of at least one autonomous cell;

determining estimated release time for production of the job;

defining a cost function monotonically decreasing with a slack time when it is determined the job can be fully completed in the current autonomous cell by its due date;

generating a bid based on the defined cost function;

informing a system server of a maximum job fraction achievable for the autonomous cell when it is determined the job cannot be fully completed in the current autonomous cell, by its due date;

providing the system server with a cost function that monotonically increases with the job fraction which can be completed;

receiving the bids in response to the information transferred to the first subset of autonomous cells to process the document processing job; and

selecting one or more of the autonomous cells of the subset of autonomous cells to process the document processing job based on information in the bids received.

7.   (Previously presented)   The method as recited in claim 6 wherein the printing workflow system stores all information regarding currently pending document processing jobs in each autonomous cell.

8.   (Previously presented)   The method as recited in claim 7 wherein the printing workflow system stores all information regarding current document processing jobs that have arrived in a print shop and have yet to be allocated for production.

9.   (Previously presented)   The method as recited in claim 8 wherein the printing workflow system stores all information regarding the currently pending document processing jobs in each autonomous cell.

10.   (Canceled)

11.   (Currently amended)   The method as recited in claim 6 wherein the selector module selects one or more of the autonomous cells of the first subset of autonomous cells with the lowest bids.

12.   (Currently amended)   A scheduling device in a printing workflow system for scheduling a document processing job among a plurality of autonomous cells, the scheduling device comprising:

a first module for determining whether the document processing job can be accomplished in one autonomous cell or a plurality of autonomous cells, wherein each autonomous cell consists of a logical grouping of resources, representing physical devices, sufficient for completing at least one type of document processing job;

a second module for determining the time it would take to process the document processing job in the first module;

a third module for defining timing parameters of one or more autonomous cells, to accomplish the document processing job based on information from the second module;

a fourth module for applying the timing parameters to the autonomous cell or plurality of autonomous cells to process the document processing job by a specific due date; and

a fifth module for queuing the document processing job in one or more autonomous cells based on the information from the fourth module to efficiently process the document processing job in by the specified due date, wherein the first, second, third and fourth modules further include sub-portions of a bidding module used to generate a bid by at least one of the autonomous cells, including,

a process routings module for determining process routings needed to complete the job,

a required processing time module for determining required processing time for completing the job for each of said routings, using optimal batch sizes,

a comparing module for comparing priority of the job with other jobs in a cell queue of at least one autonomous cell,

an estimation module for determining estimated release time for production of the job,

a cost function module for defining a cost function monotonically decreasing with a slack time when it is determined the job can be fully completed in the current autonomous cell by its due date,

a bid generating module for generating a bid based on the defined cost function,

an informing module for informing a system server of a maximum job fraction achievable for the autonomous cell when it is determined the job cannot be fully completed in the current autonomous cell, by its due date, and

a providing module for providing the system server with a cost function that monotonically increases with the job fraction which can be completed.

13. (Previously presented) The scheduling device as recited in claim 12 wherein the printing workflow system stores all information regarding the currently pending document processing jobs by each autonomous cell.

14. (Previously presented) The scheduling device as recited in claim 12 wherein the

printing workflow system stores all information regarding current document jobs that have arrived in a print shop and have yet to be allocated for production.

15.   (Previously presented)   The scheduling device as recited in claim 14 wherein the printing workflow system stores all information regarding the currently pending document processing jobs by each autonomous cell.

16.   (Currently amended)   In a scheduling device in a printing workflow system, a method for scheduling a document processing job, the method comprising:

determining, by a first module, whether the document processing job could be accomplished in one autonomous cell or a plurality of autonomous cells, wherein each autonomous cell consists of a logical grouping of resources, representing physical devices, sufficient for completing at least one type of document processing job;

determining, by a second module, the time it would take to process the document processing job in the first module;

defining, by a third module, timing parameters of one or more autonomous cells, to accomplish the document processing job based on the information from the second module;

applying, by a fourth module, the timing parameters to the autonomous cell or plurality of autonomous cells to process the document processing job by a specified due date; and

queuing, by a fifth module, the document processing job in one or more autonomous cells based on the information from the fourth module to efficiently process the document processing job by the specified due date, wherein prior to queuing, further providing a bidding process including,

determining process routings needed to complete the job,

determining required processing time for completing the job for each of said routings, using optimal batch sizes,

comparing priority of the job with other jobs in a cell queue of at least one autonomous cell,

       determining estimated release time for production of the job,

       defining a cost function monotonically decreasing with a slack time when it is determined the job can be fully completed in the current autonomous cell by its due date,

       generating a bid based on the defined cost function,

       informing a system server of a maximum job fraction achievable for the autonomous cell when it is determined the job cannot be fully completed in the current autonomous cell, by its due date, and

       providing the system server with a cost function that monotonically increases with the job fraction which can be completed.

17.   (Previously presented)   The method as recited in claim 16 wherein the printing workflow system stores all information regarding currently pending document processing jobs in each autonomous cell.

18.   (Previously presented)   The method as recited in claim 16 wherein the printing workflow system stores all information regarding current document processing jobs that have arrived in a print shop and have yet to be allocated for production.

19.   (Previously presented)   The method as recited in claim 18 wherein the printing workflow system stores all information regarding the currently pending document processing jobs in each autonomous cell.

20.   (Canceled)

21.   (Canceled)

22.   (Canceled)

23.   (Canceled)

24.   (Canceled)

25.   (Canceled)

26.   (Canceled)

27.   (Canceled)

28.   (Canceled)

29.   (Canceled)

30.   (Canceled)

31.   (Canceled)

32.   (Canceled)

33.   (Canceled)

34.   (Canceled)

35.   (Canceled)

36.   (Canceled)

37.   (Canceled)

38.   (Currently amended)   A printing workflow system disposed in a network for

coordinating production of a document processing job among a plurality of autonomous cells, the printing workflow system comprising:

a search module for searching which one or more of the autonomous cells can execute the job and creating a ~~first~~ subset of autonomous cells available to process the document processing job, wherein each autonomous cell consists of a logical grouping of resources, of representing physical devices, sufficient for completing at least one type of document processing job;

a scheduling device for splitting document processing jobs that cannot be entirely processed in a single autonomous cell into sub-jobs capable of being entirely processed in a single autonomous cell;

a transfer module for transferring information to the ~~first~~ subset of autonomous cells about the document processing job;

<u>a bidding module including,</u>

<u>a process routings module for determining process routings needed to complete the document processing job,</u>

<u>a required processing time module for determining required processing time for completing the job for each of said routings, using optimal batch sizes,</u>

<u>a comparing module for comparing priority of the job with other jobs in a cell queue of at least one autonomous cell,</u>

<u>an estimation module for determining estimated release time for production of the job,</u>

<u>a cost function module for defining a cost function monotonically decreasing with a slack time when it is determined the job can be fully completed in the current autonomous cell by its due date,</u>

<u>a bid generating module for generating a bid based on the defined cost function,</u>

<u>an informing module for informing a system server of a maximum job fraction achievable for the autonomous cell when it is determined the job cannot be fully completed in the current autonomous cell, by its due date, and</u>

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<u>a providing module for providing the system server with a cost</u> <u>function that monotonically increases with the job fraction which can be completed;</u>

a receiving module for receiving bids from the ~~first~~ subset of autonomous cells in response to the information transferred to the ~~first~~ subset of autonomous cells to process the document processing job;

a selector module for selecting one or more autonomous cells to process the document processing job based on information in the bids received; and

a queuing module for dispatching the document processing job to the selected one or more autonomous cells for processing.

39.   (Previously presented)   The printing workflow system as recited in claim 38 wherein the scheduling device assigns the sub-jobs as independent document processing jobs.

40.   (Previously presented)   The system of claim 1, wherein the autonomous cells include at least a sub-group consisting of a printer, a binder, a copier and, a collator as the physical devices.

41.   (Canceled)

42.   (Previously presented)   The system of claim 6, wherein the autonomous cells include at least a sub-group consisting of a printer, a binder, a copier and, a collator, as the physical devices.

43.   (Canceled)

44.   (Previously presented)   The device of claim 12, wherein the autonomous cells include at least a sub-group consisting of a printer, a binder, a copier and, a collator, as the physical devices.

45.   (Canceled)

46.   (Previously presented)   The method of claim 16, wherein the autonomous cells include at least a sub-group consisting of a printer, a binder, a copier and, a collator, as the physical devices.

47.   (Canceled)

48.   (Previously presented)   The system of claim 38, wherein the autonomous cells include at least a sub-group consisting of a printer, a binder, a copier and, a collator, as the physical devices.

49.   (Canceled)